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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,120	06/26/2003	Ruiping Li	22204.190336	3667

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EXAMINER

KISH, JAMES M

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 11/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/606,120

Applicant(s)

LI ET AL.

Examiner

James Kish

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application
- ☐ Other: ____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed September 1, 2006 have been fully considered but they are not persuasive.

1. Applicant argues that the mask image in Kuhn is a rough image and thus cannot be used to create what it already is. Column 6, lines 22-29 states:

Next, a mask image of the same size as the thumbnail image, is created and initialized, by setting the intensity value at the grid positions around the edge of the mask image to 0, and the intensity value of each grid position everywhere else to a 1. The purpose of the mask image, as will become apparent, is to represent the presence or absence of a possible ROI as a function of position in the down-sampled image.

Upon initialization the mask image is merely defined as being an equivalent size and shape to that of the original thumbnail image. Later in the process the pixels of this image are altered to define the actual ROI. Therefore, a rough image is created based on this initialized image mask. Independent claims 1 and 10 do not state that the rough image need be a separate entity from the image mask, but merely that the rough image is based on the mask.

2. Applicant also argues that the image mask is not based on a rectangular interesting image mask. Column 6, lines 22-29 are stated as supporting evidence for this argument (as stated in page 2 of this action). Examiner would like to point out that nowhere in this citation does it teach against having a rectangular image. In fact, upon initialization the image mask takes the shape and size of the thumbnail of the original image, which is 91x121 pixels (column 5, line 59). Radiographic images are rectangular and therefore, the initialized image mask would also be rectangular. The argument that "Kuhn's masking takes whatever shape the pixels happen to define" is in reference to the rough image that is created based on the initialized mask image. The fact that Kuhn refers to both the rough image and the initialized image mask as the same name, i.e. the mask image, is insignificant.

3. Applicant also argues that Kuhn's mask image is created based on a thumbnail image and has the same size of the thumbnail image. Therefore, Kuhn's mask image also does not cover the interesting object from the original image. At column 6, lines 1-4, Kuhn states, "In summary, the purpose of the thumbnail image is to reduce the amount of image intensity data needed to be processed, and hence the computation time needed, for finding the desired ROI." Therefore, the sole purpose of the thumbnail sized image is to reduce computational time and if this were not a factor, it would be obvious to one of skill in the art to use the original radiographic image. In fact, Kuhn states "Note also, in an alternative embodiment for very small images, if a reduction in computational time is not needed, this down-sampling step could be eliminated (column 6, lines 18-21)."

For the reasons above, the rejections for claims 1-22 still stand.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang et al. (US Patent No. 5,862,249) in view of Kuhn (US Patent No. 5,896,463). Jang discloses an automated method and system for determining the positional orientation of radiographic images. First, an image signal is acquired of the anatomical region of interest (ROI). Once acquired, the desired and undesired portions of the image are identified (column 3, lines 16-20). Upon this determination, a binary image is created (column 5, lines 59-65). This binary image is used to extract certain features that define the orientation of the image (column 7, lines 18-24 and column 8, lines 29-33). Finally, using several heuristic rules, which depend on the extracted features from the previous step, the orientation is determined (column 8, line 33 through column 9, line 28). While Jang segments the image to acquire the desired portion and removing the undesired portion, it is not processed using a mask. Kuhn teaches a method and apparatus for automatically location a desired ROI in an original digital image having a plurality of pixel intensity values. Figure 13 shows the system, which comprises an image digitizer, image data memory and a micro-processor. A mask image is created based on the

Art Unit: 3737

original image and a threshold criteria. Using the image mask, an area of pixels having a common intensity value, or a cluster of pixels, is used to define the ROI (column 3, lines 12-25). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an image mask as taught by Kuhn to define a ROI in the method disclosed by Jang to enable processing to be more efficient and effective (column 7, lines 42-47 of Kuhn).

With respect to claim 5, see column 5, lines 47-58 of Jang where an automated classification process is described.

With respect to claims 15-17, Jang searches for the center of the image (column 6, lines 14-27) as well as edge detection, which includes top, bottom, left and right edges, used for segmentation (column 5, lines 26-30). Noise removal is discussed in Kuhn in column 10, lines 32-42 and is described as dilation of the region of interest.

With respect to claim 18-19, see column 6, line 49 through column 7, line 17 of Jang.

5. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang et al. in view of Kuhn as applied to claims 1-21 above, and further in view of Hahn (US Patent No. 6,985,612). Jang discloses an automated method and system for determining the positional orientation of radiographic images and Kuhn teaches the use of mask images to identify regions of interest. However, neither reference discusses using fuzzy clustering. Hahn teaches using fuzzy clustering to categorize regions in medical images (column 2, line 61 through column 3, line 8). Also taught is the use of a

Art Unit: 3737

Gaussian function for automatic quantification by histogram analysis (column 17, lines 19-22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use fuzzy clustering and a gaussian clustering method to differentiate different regions of a medical image as taught by Hahn in order to process the image in an automatic, unsupervised manner.

Conclusion

Other related art:

Dobbins, III	4,868,857
Doi et al.	5,343,390
Erlar et al.	5,687,251
MacMahon	6,466,689

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554.

The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 3737

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK


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